STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

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November 6, 1985

HAND DELIVERED
(November 8, 1985)

Mr. Andrew King
Genwal Coal Company
P.O. Box 1201
Huntington, Utah 84528

Dear Mr. King:

Re: Abatement Plans for Notice of Violation N85-4-5-2, 2 of 2, N85-4-12-3, 1 of 3, N85-4-12-3, 3 of 3, Crandall Canyon Mine, ACT/015/032, #3, 7, Emery County, Utah

The Division has completed its review of Genwal's latest submittal (October 11, 1985) regarding the above mentioned NOV's. This recent submittal has also been found deficient. There are several sections of the Division's last deficiency review letter (September 30, 1985) which have not yet been addressed. In order to address the deficiencies of the September 30th letter, the applicable portions of that letter follow and are shown as the underlined portions of the text. The Division's current review comments follow the underlined text.

The Division has reviewed Genwal Coal Company's submittal of August 5, 1985 concerning the abatement of N85-4-5-2, 2 of 2, N85-4-12-3, 1 of 3, N85-4-12-3, 3 of 3. The submittal was determined to be deficient and incomplete. The following concerns and deficiencies must be adequately addressed before the review can be determined complete and approval granted for abatement of the outstanding violations.

1) The use of a curve number of 51 in the hydrologic designs has been determined to be inappropriate using information supplied in the original MRP. Percent cover information given on pages 26, table 3-D, p. 29, table 3-E, and p. 32, table 3-F (August 9, 1982 submittal) indicate that the use

of 63 percent cover is incorrect. Using Plate 9-1, the Division divided the area into six vegetation types and computed a weighted CN of 70 (69.3 actual) based upon those divisions. The details of this calculation are available for your use from the Division.

Additionally, the Forest Hydrologist for the Manti-LaSal National Forest has proposed a curve number of 65 for Crandall Canyon (G. Dennis Kelly, R-4 Hydrograph, 1985). The operator is requested to submit new designs utilizing this value. The SCS type II distribution should be used for all peak flow calculations.

The operator is deficient in regards to this comment. The operator utilized a Type B distribution for calculation of the peak flow values for watersheds 1,2,3, and 4. A Type II storm distribution must be utilized for all storms with a duration of 24 hours. Using this distribution, the Division has calculated peak flow values that are on the order of four times as great as the presented values in the proposal.

Additionally, the Division has received comments on the proposal from the Manti-LaSal National Forest. Based upon those comments and a meeting held between representatives from the Division and the USFS on October 28, 1985, it has been determined that the operator will be required to design all diversions based upon a 25 yr - 24 hr precipitation event. This design event is justified based upon the environmentally sensitive nature of the site and probability theory and the expected life of the mine facilities (i.e., a 45% chance of occurence of the design storm in a 15 year period). The operator has failed to submit designs for the stable passage of the 100 year-24 hour peak flow in Crandall Creek at the pond area and all other areas where the disturbed area encroaches in the Crandall Creek channel. These encroachment areas must be clearly identified on a corresponding site facilities map as well.

2) Page 14 states that the new fill for the embankment "should be compacted in place prior to placing the next lift." The application must commit to compacting each lift.

The operator states in their submittal that the fill materials shall be compacted by hand with a vibratory tamper. More specific details as to the requirements of the compaction should be proposed and committed to in the design and construction of compacted fills, including the maximum height of each lift to be compacted, the type and specifications for the equipment used, and the relative density that is to be obtained through compaction.

3) Page 14 states a stability investigation was conducted for a proposed pond in 1981 and a static safety factor was determined to be 1.4. The Division requires a static safety factor of 1.5 and a seismic safety factor of 1.1 before a variance to sideslope requirements can be granted. This requirement is especially emphasized due to the environmentally sensitive location of the proposed pond. A new geotechnical analysis of the proposed pond must be conducted and submitted. Analysis must be based on samples from the existing embankment, underlying natural material and the expected fill material. The analysis must assume empty and full pond conditions. A piezometric line from the water elevation at design depth to the toe of the slope must be assumed for both full and empty pond conditions. Additionally, plans for the size and location of the rock fragments discussed in paragraph 5 must be submitted. The application must contain designs for the stable passage of the 100 year-24 hour peak flow in Crandall Creek at the pond area and all other areas where the disturbed area encroaches in the Crandall Creek channel. These encroachment areas must be clearly identified on a corresponding site facilities map as well.

In order for the sediment pond to be in compliance with the regulations, the following requirements must be met;

a. UMC 817.46(m) The combined upstream and downstream sideslopes of the settled embankment shall not be less then 1v:5h, with neither slope steeper than 1v:2h. Slopes shall be designed to be stable in all cases, even if flatter side slopes are required.

b. UMC 817.49(c) Excavations that will impound water during or after the mining operations shall have perimeter slopes that are stable and shall not be steeper than 2v:1h. Where surface runoff enters the impoundment area, the side slopes shall be protected against erosion.

c. The minimum static factor of safety for the structure shall not be less than 1.25 under all circumstances. The design static factor of safety shall be 1.5. These criteria must be met for dry and saturated soil conditions as outlined in the initial deficiency comment.

The operator has provided a slope stability analysis of the sediment pond. It is apparent that the slope stability of the structure is marginal with respect to the requirements set forth in the regulations and those requirements of the U.S. Forest Service. Additionally, based on field observations of the existing sediment pond, it is questionable as to whether or not the structure can be constructed as per the specifications and drawings presented in the October 11, 1985 submittal for the Runoff and Sediment Control Plan for the Crandall Canyon Mine.

To obtain approval for the sediment pond structure, additional information will have to be provided to the Division. A detailed contour map and sections of the area where the sediment pond will be constructed must be provided to ensure that necessary physical constraints of the design are met. If the physical size of the pond and the embankment change through revisions and modifications to the surface facilities or hydrologic criteria, re-evaluation of the pond size and location may be necessary. The Division and The Forest Service concur that Genwal may want to consider the possibility of using culverts to protect Crandall Creek to reduce slopes or meet the physical constraints of the sediment pond location.

Stability analysis was calculated for both static and seismic conditions and for unsaturated and saturated conditions along an assume phreatic line from the water level of the pond to the toe of the outslope of the pond. The results of these calculations show that if saturated conditions exist in the embankment, that the structure will most likely fail. Although the pond design has incorporated a clay liner to minimize the amount of leakage from the pond and prevent saturation, the Division has concern regarding the integrity and the ability to monitor the effectiveness of the clay liner. Primary concern will be when the pond is cleaned and the ability to determine if

the clay liner is left intact. Secondary concern is the groundwater that may be present in the contact between bedrock and the soil beneath the sediment pond which may cause stability problems with the embankment regardless of the effectiveness of the clay liner.

Unless stability design for the sediment pond can be established with a static factor of safety of 1.5 or greater under saturated conditions, monitoring will have to be established to ensure stability. Such monitoring may have to include piezometers. If the phreatic line of the embankment rises to the point where the static factor of safety is less than 1.5, the operator would have to develop and follow a mitigation plan to regain the required factor of safety.

If the pond design and construction are modified such that the pond can meet design stability requirements of 1.5 and 1.1 factors of safety for static and seismic conditions respectively while under saturated conditions, installation of piezometers will not be required for the embankment.

The operator did not include designs for channel protection of Crandall Creek. As previously mentioned, this protection may be in the form of culverts, or may be as initially proposed using riprap armor where the disturbed area encroaches on the stream channel. This protection must be designed for the 100 year - 24 hour event.

Additionally, with respect to slope stability, more specific details of the stream channel embankments along the outslopes of the sediment pond, roads and pads must be provided. Based on the nature of the soils in the area as being cohesionless, with an internal angle of friction of 35 degrees as shown in the data provided by the sediment pond analysis, it is apparent that some of these slopes will be unstable based on their current layout and design. All applicable requirements for insuring a static factor of safety of 1.5 and protecting the hydrologic balance of the surrounding terrain as specified in the regulations shall be met.

The operator must provide sufficiently detailed maps and plans to show the slopes and configuration of all earthwork accomplished on the site and include the stability analysis for those areas which are not within the acceptable limits for slopes as they apply within the regulations.

4) Page 14 states the spillway "should be lined with riprap" as presented in Appendix A. Again, the application must commit to a specific design.

The submitted designs for the emergency spillway are not complete. The operator has proposed a riprap size of 6-8 inches ($d_{50}$) for the emergency spillway. The operator must submit design details supporting the use of this riprap size. This information must include the design velocity in the spillway and all supporting assumptions.

5) The application must contain adequate designs for energy dissipators for all outlets discharging into Crandall Creek.

The submitted designs are not adequate. The sizing for the dissipation basin must be designed for the expected velocities in Crandall Creek as the basins will be located in the Crandall Creek channel and those velocities will govern structure stability. The operator must present expected flow velocities with all supporting assumptions for Crandall Creek at the proposed basin location and for the outlet of the discharge structure (the emergency spillway and the drop structure from the surface facilities). Basin sizing must be based upon the largest of the two values.

7) Diversion sizing designs must include velocity and capacity calculations for each reach that varies in configuration or slope. Channel capacity designs must be submitted based upon the minimum slope and riprap designs based upon the maximum slope of the diversion.

This section will be reviewed upon resubmittal of the proposal incorporating the comments of item 1) above. The operator must include the above concerns in all future modified designs. Cross-sections of all proposed diversions must be submitted.

8) The delineation of the watersheds is unclear as presented on Plate 1. The watersheds must be correlated with the narrative in the text as to the structure receiving the drainage from each watershed. All watersheds and subwatersheds discussed in the text must be clearly depicted and referenced on a map.

The operator is requested to update Plate 3 (scale of 1"=50') to depict the disturbed verses undisturbed areas draining to the sedimentation pond rather than using Plate 1 (scale of 1"=200'). These areas must be identified on the map and all references in the text or calculations clearly refer to that reference identification. The current submittal refers to subwatersheds 1 and 2 although they are not clearly referenced to on a map. The Division understands the intent, but it should be clarified for future readers of the permit.

The values presented for area, slope and hydrologic length for WS-4 are in error. The application states that the area of WS-4 is 0.64 acres. The Division has determined that this area is approximately 1.5 acres. Visual comparison between WS-2 (1.28 acres) and WS-4 (0.64 acres) on Plate 1 will clarify this error.

All applicable maps (Plates 1,2 and 3) must be expanded to depict the Crandall Creek drainage channel. The submitted maps do not contain contours beyond the proposed facilities area. The contours must extend a minimum of 200 feet (horizontal) beyond (i.e. to the South) of the stream thalweg.

9) What is the slope of the proposed 18 inch CMP from the pad to Crandall Creek? Is the nomograph presented in the Appendix applicable to steep slope culverts? Please clarify designs.

Page 9/13 of the submittal states the slope of the discharge structure from WS-3 diversion to Crandall Creek is 11.1%. The Division has field checked this value and found the slopes in this area are significantly steeper (between 70% to vertical). The operator must submit details of this discharge structure clarifying this item. The requested map (item 8 above) should support the proposed slope value adequately. The operator should also note that the figure used for culvert capacity is not appropriate. An alternative figure is available for lower $L/100S_0$ values such as was presented in this submittal (8.1).

10) The operator must place a culvert beneath the pad as proposed and approved under the original MRP submittal. This diversion must be designed to pass the 25 yr-24 hr precipitation event. Energy dissipator designs must be submitted for the outlet into Crandall Creek.

Using the criteria outlined in item 1 above, the Division has calculated a peak flow of approximately 55 cfs for WS-1. Considering the size of this peak flow event and the size of the diversion required to safely pass this flow (and resulting extent of additional disturbance required), it is the Division's opinion that a culvert beneath the surface facilities pad is justified. This was approved as part of the original MRP proposal. Accordingly, the intent of that approval must be incorporated into this modification.

11) Items 2, 5, 6, 7, 8, and 10 of the Division's June 21, 1985 letter to Mr. Andrew C. King have not been addressed. These items must be adequately addressed prior to final approval of this abatement submittal.

Item 2. The operator must submit detailed maps depicting the specific locations and extent of the requested variance to the buffer zone requirements. 817 57 (a)(1) also requires plans demonstrating that the original stream channel will be restored. The operator may consult the Division as to the specific information required for this demonstration.

Items 5 and 6 of the submittal are inadequate. The operator must submit detailed plans for the handling of any contaminated soil within and around the oil storage facility at the time of final reclamation.

Item 7. All surface facilities maps should depict the location of the substation access road gate.

Item 8. The Division is awaiting comment from the USFS concerning the reclamation of the current facilities area. In the event that the USFS concurs with the operator's proposal to utilize this area as Forest user parking, the operator must incorporate this area into the approved MRP disturbed area and control and treat all drainage from this area.

12) The operator must address comments received from the USFS (letter dated August 6, 1985) which are enclosed. Through phone conversations with Mr. Sam Hotchkiss of the USFS on September 27th, it is our understanding that additional review comments will be forthcoming from them on the latest "Drainage and Sediment Control Plan" (transmitted by Genwal to DOGM on September 3, 1985).

The Manti-LaSal National Forest is currently reviewing all the EA stipulations relative to the Genwal minesite and will be forwarding comments to the operator and DOGM in the future.

13) The operator must include a specific topsoil management plan for the proposed surface facility site. The operator must remove all topsoil prior to any disturbance to the land surface. It must also be shown that the depth of the topsoil removal will be based on the results of the physical and chemical analysis and the soil survey. Based on field observations by the Division, a minimum of 12 inches of topsoil must be removed. The location of the short term topsoil stockpiling while the new surface facility site is being established must be included. The following items must also be addressed:

a. Contemporaneous reclamation of the proposed surface facility site.

b. The protection of the short term and long term topsoil stockpile from compaction, contaminants, wind and water erosion.

c. The aerial extent, dimensions, slopes, volumes and the shape of the stockpiles must be provided.

d. The location of the long term topsoil stockpile(s) must also be provided and referenced.

The operator has failed to respond to these comments. The operator must submit a narrative describing the construction, modification, use, maintenance, and removal of all the proposed surface facilities presented on Plate 3 of the Runoff and Sediment Control Plan (October 11, 1985 submittal). The plan must address overburden handling and storage areas.

14) The revegetation plan submitted as section 3.1.2 of the Earthfax Engineering Inc. report is not acceptable. While it correctly identifies those areas that need to be revegetated in conjunction with the sediment pond, the seed mix and mulching plan must be revised. The temporary seed mix identified on page 2 of the July 29, 1982 Genwal Reclamation and Revegetation Plan Changes is acceptable

provided the indicated rate is Pure Live Seed (not bulk seed). Seeding should be done in late fall prior to snowfall (generally mid to late October). The mulching plan on page 4 of the Revised Reclamation and Revegetation Plan (dated June 30, 1982) is acceptable. The operator must commit to using the seed mix and mulching plan identified above or submit an acceptable alternate plan.

The operator must address the rate of mulch to be applied if the area is to be hydromulched.

The operator must also provide a specific reclamation plan, or make specific reference to any applicable existing plan, for the new site facilities area.

The operator has not responded to this comment. This information must still be provided to the Division.

Genwal must provide complete responses to the deficient information identified above within 30 days of receipt of this letter or by December 10, 1985, whichever comes first.

Should questions arise please contact me at your earliest convenience.

Sincerely,

D. Wayne Hedberg

D. Wayne Hedberg
Permit Supervisor/
Reclamation Hydrologist

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